Mark Woods

An Appalachian Tale
Restoring Boone's Wilderness Road

The bison were the first through Cumberland Gap, finding a break carved by wind and water in the Appalachian Mountain chain. Then Native Americans followed what they called the Warrior's Path when traveling between the Ohio Valley and the Shenandoah. In 1775, Daniel Boone was hired to mark the trail. Boone's Wilderness Road, which brought wagons and a flood of European settlers across the Appalachians, was "the way west" until the mid-19th century.

In 1908, 20th-century modernization came to the mountains in the form of a Federal demonstration project by the U.S. Department of Agriculture's Bureau of Public Roads. One of several "Object Lesson Roads" designed to prove the efficacy of new road building techniques, a 2.5 mile ribbon of crushed, compacted, and rolled limestone highway was constructed through Cumberland Mountain to link the towns of Middlesboro, KY, and Cumberland Gap, TN.

As the number of vehicles and commercial traffic using the paved road grew, so did the danger. Before long, this section of U.S. Highway 25E was saddled with yet another – but tragic – nickname: Massacre Mountain.

In 1940, Congress established Cumberland Gap National Historical Park to preserve the natural gap, or low point, on Cumberland Mountain because of its national significance in the early years of American westward expansion. Part of the dream for the park was to remove the highway and restore the Cumberland Gap and Wilderness Road to its 1780-1810 appearance.

More than 60 years later, that dream has come true. The asphalt is gone. The traffic is gone. All that is left is the Gap—almost as Daniel Boone knew it.

Tunnels Through the Mountain

The restoration of Cumberland Gap began in 1973 with the signing of a law[1] directing the National Park Service to construct tunnels through Cumberland Mountain in order to remove traffic from the historic corridor traversed by U.S. Highway 25E for more than 50 years. Two objectives were detailed in the legislation: restore the historic appearance of the Gap and Wilderness Road and improve traffic safety for motorists.

Thus began a multiagency effort spanning more than two decades to open the most modern vehicle tunnels in the world and to take a landscape 220 years back in time. Through a combined planning, design, and construction effort led by the National Park Service and the Federal Highway Administration, the project would ultimately cost $265 million and include:

- rerouting 2 U.S. highways
- twin 4,600-foot tunnels
- 5 miles of new 4-lane approaches to the tunnels
- 2 highway interchanges
- 7 roadway bridges – 4 in Kentucky and 3 in Tennessee
- a 200-foot railroad bridge (a steel box girder type recognized by the American Institute of Steel Construction for design excellence)
- repair and reuse of an abandoned railroad tunnel under existing U.S. Highway 25E to house numerous utilities and serve as a part of a greenway trail system
- 2 pedestrian bridges on hiking trails
- 4 new parking areas inside the park

With the project authorized in 1973, the process of creating design alternatives and construction plans began. The 1978 Federal Highway Act brought the first funding for tunnel construction. Project design work started in 1979 and construction in 1985 on a pilot tunnel 10-feet wide, 10-feet high, and 4,100-feet long drilled from both sides of the mountain. The pilot tunnel took 2 years to drill and revealed the geologic and hydrologic challenges facing the project—springs that would produce 450 gallons of water every minute regardless of the weather,

voids with thick clay infills, caverns as tall as 85 feet, and a lake of water 30-feet deep.

To keep the tunnels dry, each is lined with a waterproof PVC membrane that is covered with a 10-inch-thick concrete lining. Groundwater drains into a stream that empties into Little Yellow Creek within the park. Water from the caverns flows through a 5-foot-diameter steel pipe under the roadway and into the cavern on the opposite side of the tunnel. During construction, daily water quality monitoring was required; today water flow is monitored in the tunnel's Kentucky control room.

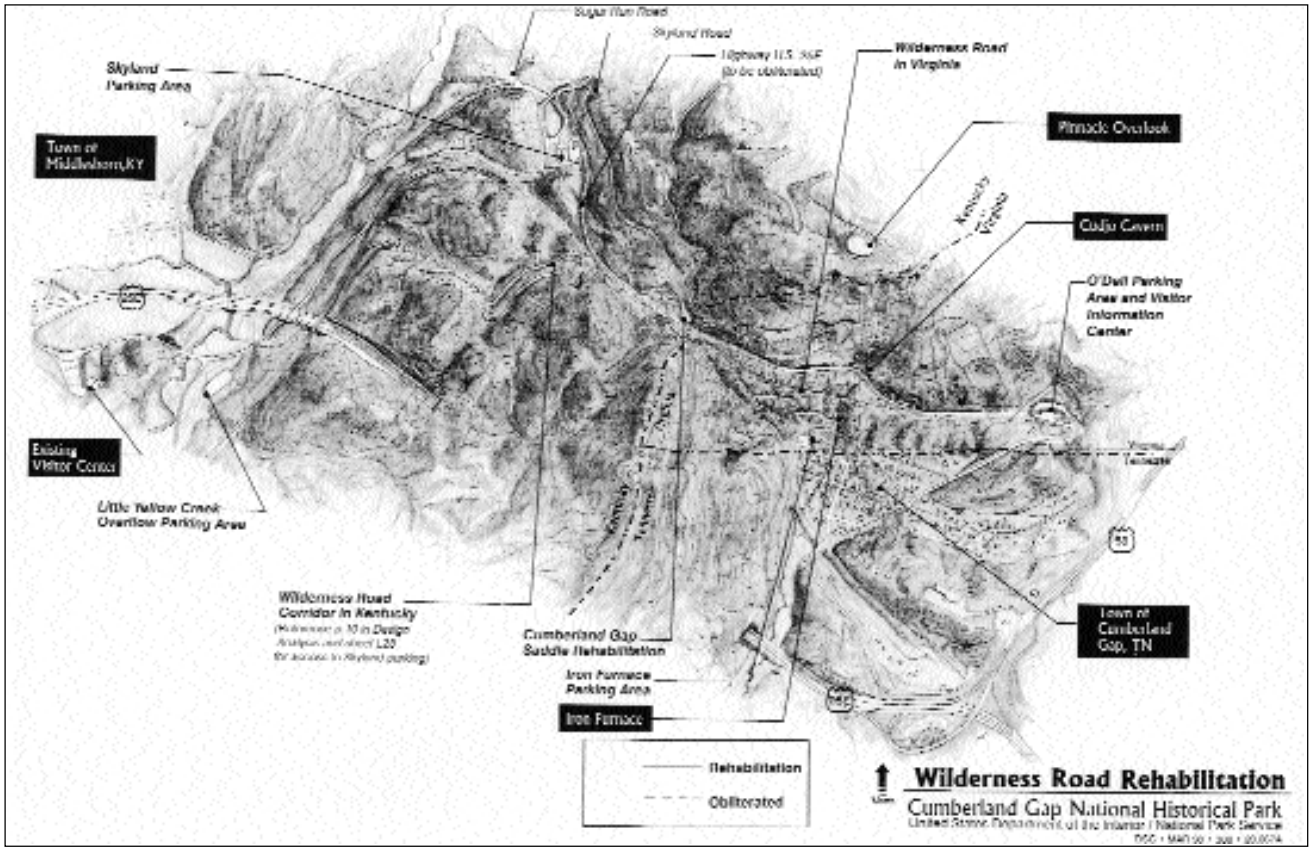
With the opening of the tunnels to traffic in October 1996, the dangerous section of U.S. Highway 25E could be closed to the more than 18,000 vehicles that daily passed through the historic park. Today, the tunnels carry more than 11 million vehicles annually, or approximately 32,000 cars per day.

Restoration and Mitigation

It is noteworthy that the Final Environmental Statement on the project cited the rehabilitation of the Gap and Wilderness Road as the mitigation for the construction of the tunnels. This daunting mitigation project – crucial to fulfilling Congress' intent in creating the park – became a key component of the site's development concept plan.

In the early 1990s, as construction proceeded on the tunnels, extensive research began to identify road routes and topographical land forms altered or destroyed during the construction of the Object Lesson Road and later improvements to U.S. Highway 25E. This information was used to complete the mitigation plan and prepare the design for the rehabilitation of the Gap's historic landscape.

Historical documentation regarding the significance and location of the Gap and the Wilderness Road was available from a study prepared by National Park Service historian Jere L. Krakow in 1987.[2] In addition, Michael F. Hart, a visual information specialist (now retired) with the National Park Service's Denver Service Center, was challenged with rediscovering the alignment of the Wilderness Road and other significant early trails as well as the approximate "historic" contours of the topography of the "saddle of the Gap."



Hart's methodology combined with Krakow's work were used to prepare construction documents advertised to potential contractors in the winter of 2001. A rare combination of artistic skills, historical research, and knowledge of photography, surveying, and cartography created documents that guided contractors to successfully rehabilitating the historic landscape at the Gap and the adjacent corridor that had been the highway.

The methodology involved a combination of fieldwork and research using, among other elements, an 1833 survey, an 1862 map, re-creation of historic photographs by locating original camera positions, surveying from reference points, aerial photographs, and extensive field study along the mountainside.

In verifying the original landscape, specific coordinates were determined for known points such as Cudjo Cave, Gap Creek, and the Iron Furnace, resulting in delineation of key resources throughout the historic district. The National Park Service and the Federal Highway Administration used Auto-Cad to merge four kinds of digital survey data into a single, composite survey database creating a three-dimensional view of the historic landforms of the Gap and surrounding mountainside. The resulting grading plan enabled engineers and landscape architects to calculate the quantities of cut and fill materials needed to produce the historic features that had been lost to modern roadbuilding.

Prior to the rehabilitation project, the Gap was estimated to be 32 feet lower than it was 223 years ago. An estimated 215,000 cubic yards of fill dirt, much of which had been retained during tunnel construction, was used to return the Gap to contours that probably existed in 1780.

In July 2001, a contract was awarded to Estes Brothers Construction Company of Jonesville, VA, to rehabilitate the area. The first order of business included removing approximately 13,000 tons of asphalt. This was followed by demolishing the former roadway, including uncovering areas that had previously been filled with dirt to produce a reasonable grade as well as filling in areas that had been cut through with heavy equipment to produce the former highway.

Following the recontouring of the landscape, completed just 9 months after the contract was awarded, the area around the approximately 10-foot-wide wilderness trace was planted with native grasses, shrubs, and trees. This was made possible through a multiyear agreement between the U.S. Department of Agriculture, Natural Resource Conservation Service, and the National Park Service. This collaboration included harvesting seeds from the park and propagating and replanting thousands of native plants and trees.

In the late spring of 2002, college students from nearby Lincoln Memorial University planted 20,000 trees in one weekend, transforming barren landscape into a virtual forest overnight.

The final phase of this incredible project is scheduled for fiscal year 2003. This will include an outdoor interpretive center with a ranger station for cave tours, an interpretive pavilion and exhibits, and restrooms.

The New Wilderness Road

Today the topography of the Gap is starting to look more like it did in 1750 when Dr. Thomas Walker, surveyor for the Loyal Land Company, explored the area and wrote in his journal:

> On the north side of the gap is a large spring, which falls very fast, and just above the spring is a small entrance to a large Cave, which the spring runs through, and there is a constant Stream of cool air issuing out.

Walker is credited with naming the Gap in honor of William, Duke of Cumberland, brother of King George II.

This mountain pass has been known by many names over the years, some associated with royalty, some with tragedy. But no name is more evocative of its role in American history than Wilderness Road. Today's vistors, like the travellers who journeyed this way 225 years ago, can step back in time and once again share a path with Daniel Boone.

Notes

1 Public Law 93-87.

2 Jere Krakow is currently general superintendent of the National Trails System program in the National Park Service's Intermountain Region.

Mark Woods is superintendent of Cumberland Gap National Historical Park.